

Natural Resources Policy: Management, Institutions, and Issues

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Summary

Natural resources management remains a significant issue for the federal government. Growing demands on the nation's resources and interest in their protection and allocation among multiple uses have increased the complexity of management. The federal role in defining policy and institutional context shapes the combination of supported uses and protection measures.

Certain themes are common to federal resource issues. Many conflicts center on balancing traditional versus alternative uses and protection programs, managing to produce national or local benefits, and supporting current or future resource consumption. Other challenges involve the effect of federal resource management on private lands, fees for using federal resources, and financing of management efforts. Interagency conflicts and overlaps and the coordination of federal, state, and local efforts also are common implementation problems.

For many reasons, Congress often confronts resource issues based on the natural resource in question—lands and related resources, oceans and coasts, species and ecosystems, or water. Federal land issues include land ownership and management, prioritization of uses, designation of special areas, and fee collection and disbursement. Energy production and recreation on federal lands remain controversial. Indian land issues include energy rights-of-way across tribal lands and treaty rights. Ocean topics encompass broad policy questions, such as whether to respond to recommendations by two commissions for more coordinated ocean policies and institutions. More specific multi-use management challenges range from fisheries, marine mammal, and coastal zone management, to adherence to the U.N. Convention on the Law of the Sea. Species management and ecosystem protection topics include federal protection and habitat designations for threatened and endangered species, prevention and response to invasive species, protection of international species, wetlands protection, and large-scale ecosystem restoration. Increased competition for water has fostered interest in the federal role in water resources, particularly in relation to water supply in western states and multi-use river management. Other water topics are dam and levee safety and security, and transboundary water resources management.

Natural resource science and management contributes to understanding and mitigating the nation's natural hazard risks. Science also is instrumental in defining the uncertainty and potential extent and impact of climate change and weather on resource conditions.

Often natural resource management is intertwined with other topics of broad public concern, such as environmental protection, energy, and agricultural policy. The 110th Congress may pursue natural resources topics in the context of these other policy areas as well as through authorizations, appropriations, and oversight related to specific natural resources issues.

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Natural Resources: The Policy Setting

Natural resource management remains a significant issue for the federal government, and the availability of particular natural resources, such as energy resources, can be matters of broad public concern.¹ Natural resource availability represents both an opportunity and constraint for human activities. Local, state, and federal government policies define the intertemporal distribution and use of the nation's natural capital stock of soil, minerals, forests, water, fisheries, etc. Growing demands and pressures for both resources and services from the nation's resources, plus heightened interest in how these resources are used, have increased the complexity of their management and administration. Resource management decisions have economic, social, and environmental implications, which may be local, national, or international.

Who decides how natural resources should be managed and how the decisions are made remain topics of debate. The federal role in natural resource management continues to be controversial. Some stakeholders seek to maintain or enhance the federal role in resource management. Others support more local influence or international decision-making in some cases.

Often the resource issues debated in Congress are focused on specific management tools and their effects (e.g., changing grazing fees, reforming mining laws, restructuring the Endangered Species Act), rather than on broader goals and objectives of resource policies. However, debate on specific management issues may encompass discussions of broad principles, such as the principles of multiple use and sustainable yield² that underpin the management philosophies of some federal resource agencies and whether they remain appropriate for the current demands, constraints, and values of resources.

Historic Resource Management

The United States is one of the few countries that possesses a vast array of natural resources—only Canada, Russia, and Brazil have similar endowments. Initially, U.S. policy focused on disposal of federal lands and use of resources to encourage settlement and development of the country. Several waves of conservation, beginning in the 1870s, began to shift this vision. Establishment of Yellowstone as the first national park in 1872 and setting aside in 1891 of unreserved public timberlands as national forests for watershed protection were important early landmarks in development of new policies.

Through the 1950s, government policies and institutions largely favored regional resource users (e.g., ranchers, miners, loggers, and irrigators). For example, the federal government often encouraged the settlement, use, and development of federal lands and resources at little cost to users. In the 1960s, more people began questioning the rationale behind federally supported resource use, and the politics began to change due to two main factors—the demand for recreation and amenity goods increased sharply, and the environmental-conservation movement gained political momentum and increasingly sought judicial rulings in favor of greater protection. These factors shifted policies away from those that favored traditional resource users. Tension

¹ For purposes of this report, a general definition of *natural resources* is those naturally occurring resources and systems either useful or potentially useful to humans under plausible technological, economic, and social circumstances (including when their existence, possession, or use is of aesthetic or spiritual value).

² For purposes of this report, a general definition of *multiple use* is the management of renewable resources so that they are used in the combination that best meet the needs of the American people. A general definition of *sustainable yield* is the achievement and maintenance in perpetuity of a high-level of regular output of renewable resources.

between traditional and alternative uses and protection programs remains a prominent factor in the current debate over natural resource management.

Management Challenges: Balancing Uses and Sustainability

Certain themes are prevalent during consideration of many resource questions. Common themes include how to balance the tensions in multi-use management and protection programs, whether resources should be managed to produce national or local benefits, and how to balance current uses with future supplies and opportunities. Conflicting views reflect different values, needs, and perceptions of the condition of resources and the sustainability of uses. While specific management concerns are constantly in flux, many of the concerns fall under the same categories that have confronted policy-makers for decades:

- role of the federal government in establishing policies;
- interagency conflicts and overlaps;
- sources and levels of funding;
- information and role of science; and
- coordination of federal, state, and local efforts.

Although these categories of issues are fairly constant and broader questions of resource goals and management objectives remain, Congress for many reasons typically confronts the resource issues based on the natural resource in question—lands and related resources, oceans and coasts, species and ecosystems, or water.

Conflicting public values concerning federal and Indian lands raise many questions and issues, such as how much land the federal government should own, how managers should balance conflicting uses (e.g., grazing, timber, habitat, recreation), whether Congress should designate specially protected areas, and when and how agencies should collect and distribute fees for land and resource uses. Multiple use management is an approach to balancing use conflicts that can occur on federal lands. Federal land ownership and management continues to be controversial, especially in some western states where the federal government owns half or more of the land. Congress continues to examine the multi-use land management through legislative proposals, program oversight, and annual appropriations for the four major federal land management agencies. Energy production on federal lands, protection from wildfires, range management, and recreation have been at the forefront of congressional debates in recent Congresses. Indian land issues include energy rights-of-way across tribal lands, especially the amount of compensation sought by Indian tribes.

Increasing use of coastal and marine resources is driving proposals to alter the relationship between environmental protection and sustainable resource management. Recent reports note declines in marine resources and shortcomings in the fragmented and limited approaches to resource protection and management in federal and state waters. A further concern is the increasing pressures and conflicts that arise from economic activity associated with continued human population growth in coastal areas. Within coastal areas, the most attractive and highest-valued properties often are the most hazardous, exposed to the forces of wind and waves that accompany ocean storms, hurricanes, and tsunamis. Increased use of coastal and nearshore areas has promoted conflict with ocean energy development and production from Outer Continental Shelf oil and gas platforms as well as wind farms. Current projections that sea levels will continue to rise will likely make coastal sites more hazardous in the future.

The numbers of animal and plant species facing possible extinction are rising, and some of the ecosystems that they rely on are changing or degrading, raising both species-specific and ecosystem-based management questions and challenges. Some stakeholders contend that species loss may have social and economic impacts, and therefore assert that all species should be saved. However, others hold that the cost to society of protecting species with the aim (but not the certainty) of saving them is substantial, while the benefits are vague. Dwindling species are often indicators of habitat loss or alteration. Habitat loss often results from development, changes in land and water management practices, competition from invasive species, and other factors, nearly all affected by economic, political, or social interests. Because of the tradeoffs inherent in species and ecosystem management decisions, goals and objectives for species protection, ecosystem restoration, and invasive species control remain controversial. For example, is recovery of all species listed under the Endangered Species Act a realistic goal? Similarly, differences of opinion continue over the tradeoffs, performance, and expense of approaches being employed in restoration, species protection, and invasive species control. For example, can the multi-billion dollar wetlands restoration proposals for coastal Louisiana restore the coastal ecosystem without requiring significant changes to the management of the Mississippi River?

Increasing pressures on the quality and quantity of available water supplies—due to growing population, environmental regulation, in-stream species and ecosystem needs, water source contamination, agricultural water demand, climate variability, and changing public interests—have resulted in heightened water use conflicts throughout the country, particularly in the West. The federal government has a long history of involvement in water resource development and management to facilitate water-borne transportation, expand irrigated agriculture, reduce flood losses, and more recently restore aquatic ecosystems. Although there is no broad federal water policy, Congress makes decisions that define the federal role in the planning, construction, maintenance, inspection, and financing of water resource projects. Congress makes these decisions within the context of multiple and often conflicting objectives, competing legal decisions, and long-established institutional mechanisms (e.g., century old water rights, contractual obligations, etc.). Hurricane Katrina raised questions about the federal role in water resources; in particular, the disaster brought attention to the trade-offs in benefits, costs, and risks of the current division of responsibilities among local, state, and federal entities.

Many resource debates are shaped by the availability of information on the resources. Consequently, the role of science is another common theme in resource discussions. For example, science is instrumental in defining the uncertainty and potential extent and impact of climate change and weather on resource stocks and conditions. Similarly, resources availability and abundance may represent both opportunities and hazards, for example drought and flooding.

Natural resources management often is intertwined with issues in other policy areas. For example, relationships between natural resources management and environmental protection are evident in many issues, such as groundwater contamination's effect on rural water supply. Cross-cutting issues are discussed in this report if the congressional concern revolves principally around resource conditions and supply. Similarly, debates on energy policy encompass questions of access to energy resources and the impact of energy production on lands and resources. While a few energy resource issues are covered in this report, information on energy policy broadly is contained in CRS Report RL31720, *Energy Policy: Conceptual Framework and Continuing Issues*, by Robert Bamberger. Many natural resource issues, especially ones dealing with resource conditions and uses on private lands, overlap with agricultural topics. For information on federal conservation programs for agricultural lands, see CRS Report RL33556, *Soil and Water Conservation: An Overview*, by Tadlock Cowan and Renée Johnson.

Management, Institutions and Issues: Natural Resources in the 110th Congress

Congress deals with natural resource issues on a number of fronts. Key laws, programs, and issues are handled by several authorizing committees in the House and Senate. Many issues involve several committees, such as those involving wetlands protection and restoration. In addition, natural resource issues often are addressed during consideration of annual appropriations bills for natural resource agencies, programs, and activities.³ The 110th Congress is likely to weigh whether federal funds for natural resources issues are adequate and focused on the appropriate resource priorities. In many cases, natural resource issues do not divide along clear party lines. Instead, they may be split along rural-urban, eastern-western, coastal-interior, or upstream-downstream interests.

This section briefly discusses 31 selected natural resource issues that the 110th Congress may consider through oversight, authorizations, or appropriations. The 31 issues have been grouped into five categories, as follows:

- Federal and Indian Lands and Resources
- Natural Hazards, Climate, and Earth Science
- Ocean and Coastal Affairs
- Species Management and Ecosystem Protection
- Water Resources

Federal and Indian Lands and Resources

Conceptual Framework

The federal government manages about 650 million acres of land and resources—about 29% of the 2.27 billion acres of land in the United States. Four agencies, three in the Department of the Interior (DOI), administer about 95% of federal lands: the Forest Service (FS) in the Department of Agriculture (USDA), and the Bureau of Land Management (BLM), Fish and Wildlife Service (FWS), and National Park Service (NPS). The federal government, through DOI's Bureau of Indian Affairs (BIA), also is responsible for the management of lands held in trust for Indian tribes and individuals (whether on and off reservations), which cover an additional 56 million acres.

Ownership of lands by the federal government has long generated controversy and may continue to do so in the 110th Congress. A key area of debate is how much land the federal government should own—and hence whether some federal lands should be disposed to state or private ownership, or whether additional land should be acquired for conservation, open space, and other purposes. For lands retained in federal ownership, debates may involve whether to curtail or expand certain land designations or if current management procedures should be changed. Also, the extent to which federal lands should be preserved, made available for development or resource extraction, or opened to recreational uses raises a variety of resources policy matters, especially with respect to preserving wildlife habitat, designating wilderness areas, grazing livestock, harvesting timber, and developing energy resources. For instance, Congress may

³ For information on appropriations bills and issues, and links to CRS reports, see the CRS website at http://apps.crs.gov/cli/level_2.aspx?PRDS_CLI_ITEM_ID=73.

continue to consider whether to increase availability of onshore and offshore lands for energy and mineral development, and if so, under what if any restrictions. Management of Indian lands and resources also can be controversial, and Congress may be asked to address land claims, water rights, fishing, and energy and other development issues.

Arctic Oil, Arctic Refuge (ANWR)

The future of the biological resources, wilderness values, and energy potential of northeastern Alaska has been debated in Congress for more than 40 years. A question for the 110th Congress is whether (1) to protect further the biological and wilderness resources of what is now the Arctic National Wildlife Refuge (ANWR) through a statutory wilderness designation, (2) to open a portion of the refuge to development of potentially the richest onshore oil source remaining in the United States (and if so, under what restrictions), or (3) to maintain the current status of the area. Unless Congress chooses to act, the entire refuge will remain closed to development under provisions of the 1980 Alaska National Interest Lands Conservation Act (P.L. 96-487). The 109th Congress rejected inclusion of ANWR development in omnibus energy legislation, although the House approved a separate bill to open the Refuge to development. An attempt to include ANWR development in a budget reconciliation package was not successful.

Federal Land Funding

Funding for federal lands continues to be contentious. Federal lands and natural resource programs compete against other federal priorities (defense, education, etc.) as well as internally among the several land and resource management agencies. Perennial questions relate to the Land and Water Conservation Fund (LWCF). This account is credited with deposits of \$900 million annually, but funds can be spent only when Congress enacts appropriations. Congressional attention to this issue may continue to center on (1) the amount to appropriate annually to each of the four eligible federal land management agencies, and to the state grant program; (2) which lands should be acquired; and (3) use of LWCF funds for purposes other than land acquisition. The primary context for debating these issues may be the annual Interior appropriations legislation. Other policy questions for federal lands funding relate to setting fees. For instance, Congress may oversee agency efforts to establish, collect, and distribute fees for recreation at federal lands and waters.

Another key funding issue is compensating counties for the tax-exempt status of federal lands. Appropriations for the primary compensation program, Payments in Lieu of Taxes (PILT), have not kept pace with the increasing authorized level. The 110th Congress may address PILT funding as part of annual Interior appropriations legislation, and proposals to provide permanent appropriations for PILT may again be introduced. Another compensation program, the Secure Rural Schools and Community Self-Determination Act (P.L. 106-393), was enacted to offset FS and BLM payments that had declined due to lower timber sales. This act expired at the end of FY2006; Congress may consider legislation to reauthorize the program.

Forests and Fire Management

Wildfires can kill firefighters, burn homes, threaten communities, and destroy trees. Reducing fuels in the federal forests is being undertaken to reduce the threats from fire, although the threats are not limited to federal forests. In December 2003, Congress enacted the Healthy Forests Restoration Act (P.L. 108-148) to facilitate forest fuel reduction activities and for other purposes less directly related to wildfire protection. Legislation to expedite rehabilitation and recovery activities following significant forest-altering events, such as major forest fires, was debated but

not enacted by the 109th Congress. The 110th Congress is likely to consider oversight and authorization of fire programs.

The 110th Congress also might address questions about the process, as well as the level, for federal firefighting funding. Spending on fire suppression and preparation now account for nearly half of the FS budget, and funds can be “borrowed” from any other FS account if suppression costs exceed appropriations. Repayment is contingent on subsequent appropriations. Recent severe fire seasons have led to significant borrowing, with implementation effects on other FS programs.

The Bush Administration has made several regulatory changes related to forest management, public involvement in FS planning and decision making, environmental impacts of FS activities, and fuel reduction. Changes include:

- categorical exclusions from analysis and documentation under the National Environmental Policy Act (NEPA; 42 U.S.C. §§ 4321-4347), involving various activities, including fuel reduction, post-fire rehabilitation, and “small” timber sales;
- modified review procedures, for example, for administrative review and internal Endangered Species Act consultations;
- new rules governing national forest uses, such as for issuing special use permits and for protecting roadless areas; and
- new rules pertaining to national forest planning under the National Forest Management Act of 1976 (NFMA; 16 U.S.C. §§ 1600-1616, et al.).

There continues to be substantial uncertainty over management of the national forests, and many of these regulations have been challenged in court. The 110th Congress may conduct oversight of some of the regulatory changes and related litigation.

Indian Lands and Resources

American Indian reservations (trust and non-trust lands),⁴ off-reservation trust lands, and Alaska Native corporation (non-trust) lands cover more than 116 million acres (5%) of the United States—about 71 million acres in the lower 48 states (about 54 million in trust) and about 45 million acres in Alaska (about 1 million in trust). Indians also have interests in non-Indian lands, waters, and other natural resources, as subjects of legal rights, objects of legal claims, culturally important areas, or economic resources.

Indian land issues include energy rights-of-way across tribal lands, especially the compensation sought by Indian tribes. This is the subject of a report mandated by §1813 of the Energy Policy Act of 2005 (P.L. 109-58) and due from the Departments of Energy and the Interior. A draft “1813 report” report was issued for comment on August 8, 2006, and a final “1813 report” report currently is being prepared. Some tribes fear the report may recommend that Congress amend current laws requiring Indian consent for energy rights-of-way. Indian lands also are involved in royalty collection controversies, since the Minerals Management Service (MMS) collects royalties for oil and gas production on Indian lands as well as federal lands. (See “Onshore Energy Resources.”)

⁴ “Trust lands” is a general term covering (a) trust lands strictly defined, which are lands whose title is held by the federal government in trust for an Indian tribe or individual, and (b) restricted lands, which are lands whose title is held by an Indian tribe or individual but which cannot be sold or encumbered (e.g., mortgaged) without federal approval. “Non-trust land” is any land that is not trust land.

Significant topics for non-Indian areas include rights to water and to wildlife resources, and management of Indian sacred sites. In a number of western states, Indian tribes' assertion of water rights claims, while based on reservation or trust lands, may impinge heavily on non-Indian water use. Many tribes are participating in water negotiations or adjudications with states, local governments, and other water users. The 110th Congress may be asked to consider California, Montana, and New Mexico tribal water rights claims, if settlements are reached. Fish and wildlife management on non-Indian lands and waters—involving, for instance, caribou in ANWR (see “Arctic Oil, Arctic Refuge (ANWR)”), or salmon and other fish in the Pacific Ocean and the Columbia, Klamath, and Trinity rivers—also has given rise to fishing, development, and water rights controversies that Congress has been asked to address. Numerous Indian sacred sites—many (perhaps most) of which are not identified—occur on federal lands. To protect sacred sites, Indians have unsuccessfully sought legislation setting general restrictions on agencies' management of federal lands for development, recreation, and other purposes, and may again seek such legislation in the 110th Congress.

Onshore Energy Resources

A controversial management question is whether to increase availability of federal lands for energy and mineral development. In the 110th Congress, oversight of the effectiveness and enforcement of current laws regarding oil and gas production on federal lands is likely. The U.S. Geological Survey estimates that significant oil and gas resources exist below some onshore federal lands that are now off-limits to energy development, particularly in the Rocky Mountain region. Industry and the Bush Administration contend that entry into some of these areas is necessary to ensure future domestic oil and natural gas supplies. Opponents maintain that there are environmental costs associated with exploration and development, and that the United States could meet its energy needs through increased exploration elsewhere and energy conservation.

The permitting process to drill also has come under scrutiny from industry and environmental groups. The need to update Resource Management Plans (RMPs)⁵ is cited by BLM as the major cause for permitting delays. Comprehensive energy legislation (P.L. 109-58) affects energy development on onshore federal lands with provisions to streamline the permitting process. The law establishes the Federal Permit Streamlining Pilot Project in seven BLM field offices. A report due to Congress in 2008 is to outline the results and advise whether a national program is appropriate. Additionally, BLM has implemented new management strategies intended to remove impediments and streamline the permitting process for developing onshore federal oil and gas resources. During FY2006, BLM processed 15% more applications for a permit to drill (APD), and the number of permit applications rose by 29% over FY2005. Environmental and outdoor groups assert that expediting the permitting process has been detrimental to hunting, fishing, and protecting wildlife areas.

Onshore Mineral Resources

The 110th Congress may consider whether to reform the General Mining Law of 1872. The law grants free access to individuals and corporations to prospect for minerals in public domain lands, and allows them, upon making a discovery, to stake (or *locate*) a claim on that deposit. A claim gives the holder the right to develop the minerals that may be *patented* to convey full title to the claimant. However, a patent is not necessary to develop the minerals. Since FY2005, Congress has imposed annual moratoriums on mining claim patents. A continuing policy issue is whether

⁵ RMPs are required by the Federal Land Policy and Management Act (43 U.S.C. §1712).

this law should be reformed, and if so, how to balance mineral development with competing land uses.

The right to enter federal lands and freely prospect for and develop minerals is the feature of the claim-patent system that draws the most vigorous support from the mining industry. Critics consider the claim-patent system a giveaway of publicly owned resources because of the small amounts paid to maintain a claim and to obtain a patent. Also, mineral production generally occurs without paying royalties to the federal government, unlike the oil and gas leasing program on public lands. A key area of debate is whether to reform the General Mining Law of 1872 to include some form of royalty.

The lack of direct statutory authority for environmental protection under the 1872 Law also has spurred reform proposals. Supporters of the current law contend that other laws provide adequate environmental protection. Critics assert that these general environmental requirements are inadequate to assure reclamation of mined areas, and that the only effective approach to protecting lands from the adverse impacts of mining under the current system is to withdraw them from development under the Mining Law. Further, critics charge that federal land managers lack regulatory authority over patented mining claims, and that clear legal authority to assure adequate reclamation of mining sites is needed. An additional policy issue is whether to respond to the mining industry's interest in removing what they view as delays in issuing permits to develop minerals on federal lands.

Park Management and Recreation

The NPS mission, to provide for the public enjoyment of parklands while protecting park resources, has fostered continuing management challenges. The 110th Congress may oversee implementation of revised park management policies issued in 2006. Congress also likely will address the adequacy of funds for the National Park System, for instance, for general operations, facilities maintenance, and security. NPS continues to define and quantify its maintenance needs, but the extent of progress toward eliminating the agency's multibillion dollar backlog of deferred maintenance remains unclear. Congress also funds and oversees NPS efforts to enhance security for "national icon" parks and units along U.S. borders. Further, each Congress typically considers many park and recreation measures to designate or study sites for inclusion in the System and to expand or adjust park unit boundaries. The NPS provides technical and financial assistance to National Heritage Areas (NHAs), which are designated by Congress but are not federally owned. In view of the large number (37) of existing NHAs, and considerable interest to study and designate additional areas, Congress may again consider whether to enact legislation that would provide consistent program criteria for NHA designation, management, and funding.

Recreation in park units, as well as on BLM, FS, and other lands, is a focal point of debate over the management of federal lands. Primary topics of discussion include access for recreation generally, and the effect of recreation—especially motorized recreation—on natural resources, visitor experience, and local economies. Specific NPS conflicts center on snowmobiles in three Yellowstone area parks, air tour overflights and "natural quiet" at Grand Canyon National Park (GCNP), and implementation of the Colorado River Management Plan for GCNP to allocate river access for commercial and noncommercial boaters. While trail designation is often popular, quantity, quality, and funding for trails may continue to pose management challenges for the NPS and other federal agencies. Recreation issues also arise in other areas, such as reservoirs and waterways managed by the Army Corps of Engineers and Bureau of Reclamation. Potential subjects of congressional oversight include balancing recreational water needs and other purposes, financing maintenance of recreational facilities, and establishing fees for recreation at federal lands and waters.

Rangelands

Management of federal rangelands, particularly by the BLM and FS, presents an array of policy matters for Congress. The federal grazing fee for private livestock grazing on federal lands has been controversial for decades. Instances of grazing on federal land without a permit or payment of fees, and agency actions to fine and jail owners and impound and sell trespassing cattle, also have been contentious. Federal rangeland condition is a recurring interest for Congress, with differences over the effect of grazing on rangelands and the location and amount of grazing overall and in specific allotments. Many view invasive and noxious weeds as an expanding threat to the health and productivity of rangelands. (See “Invasive Species.”) Restricting or eliminating grazing on some federal land because of environmental and recreational concerns may again be considered. These efforts are opposed by those who support ranching on the affected lands for lifestyle, environmental, and economic reasons. Some proposals have sought to compensate grazing permittees who voluntarily relinquish their permits, while others would provide compensation when agency decisions reduce or eliminate permitted grazing. Another policy issue involves whether to continue the automatic renewal of expiring grazing permits and leases, with one law authorizing temporary renewal without environmental studies for those permits and leases expiring through FY2008. Further, Congress may conduct oversight of changes BLM made in 2006 to its grazing regulations.

In addition, there is continued interest in BLM’s management of wild horses and burros, and efforts to remove them from the range to achieve “appropriate management levels.” The adoption and sales programs and the slaughter of healthy animals have been of particular focus. Proposals may again be introduced to overturn the BLM’s sale authority and other changes enacted in 2004, or to foster the sale and adoption of wild horses and burros.

Wilderness and Roadless Areas

Federal agencies manage some federal lands to preserve natural conditions for biological, recreational, or scenic purposes. In 1964, the Wilderness Act created the National Wilderness Preservation System, with statutory protections that emphasize preserving areas in their natural state. Wilderness areas included in the System generally cannot have permanent roads and structures, and use of machines and mechanized travel generally are prohibited. Designating new wilderness areas thus can be controversial, because it favors preservation values over uses requiring roads and motorized equipment. Units of the Wilderness System can only be designated by Congress. Many bills to designate wilderness areas typically are introduced in each Congress; more than 30 were introduced in the 109th Congress, and 5 were enacted.

The wilderness potential of many areas has been examined by BLM under the Federal Land Policy and Management Act (FLPMA). These areas—Wilderness Study Areas (WSAs)—are all managed to preserve their wilderness characteristics, regardless of whether BLM recommend them to be wilderness, until Congress designates them as wilderness or releases them for other uses. WSAs have raised legal questions, including whether FLPMA allows the BLM to conduct additional wilderness inventories or to create new WSAs, and whether legislation is needed to allow multiple use management of WSAs not designated as wilderness. In addition, some BLM lands do not include the headwaters of water sources flowing through the land, which may raise water rights and other issues as part of congressional consideration of designating BLM wilderness areas.

Management of the national forest roadless areas remains controversial. The Clinton Administration promulgated nationwide rules to protect *inventoried roadless areas* in the National Forest System by precluding most roads and timber harvesting. Critics have called these

roadless rules de facto wilderness management, while supporters note that more roads and timber cutting were allowed under the rules than for areas in the National Wilderness Preservation System. The validity of the Clinton rules was litigated, and implementation enjoined. The Bush Administration finalized new rules that eliminated the nationwide approach, returned management of roadless areas to the normal planning process for each forest unit, and gave state governors the option to petition for protecting roadless areas in their states. The Bush rules made moot the litigation over the previous rules. However, separate litigation successfully challenged the Bush rules, leading to reinstatement of the Clinton rules. The Bush Administration has continued to implement the state petition process under the Administrative Procedure Act. The 110th Congress may conduct oversight of agency rulemaking and related litigation, and may consider legislation addressing roadless areas management.

Natural Hazards, Climate, and Earth Science

Conceptual Framework

The costs of natural disasters in the United States are rising, and the 110th Congress may examine policies that mitigate risk to lessen or avert the financial, social, and physical impacts of disasters. How the federal government addresses disasters may be complicated by potential impacts from a changing climate in vulnerable regions of the United States. For example, low-lying coastal regions may be faced with rising sea levels as well as the possibility of more intense or more frequent severe storms. Federal activities that enhance the nation's ability to mitigate or protect against losses to communities and degradation of natural resources include the Flood Map Modernization Initiative, operated by the Federal Emergency Management Agency (FEMA, in the Department of Homeland Security). The National Oceanic and Atmospheric Administration (NOAA, in the Department of Commerce) provides weather forecasts, conducts applied research, and issues warnings that serve to protect against natural hazards, such as tsunamis. Other federal agencies also generate geospatial data that contribute to new and updated hazard maps that help identify potential risks. Congress may consider whether authorization is needed to centralize geospatial data to enhance the nation's capability to reduce the impacts of natural disasters. Congress also may consider how a changing climate affects the ability of the federal government to develop, manage, and protect the nation's natural resources.

Climate and Natural Resources

There is general scientific agreement that the climate is changing, and that some parts of the country, such as Alaska, may experience faster rates of change and more severe impacts. The magnitude of climate change, the rate of change, the geographic distribution of its impacts, and whether particular impacts are beneficial or harmful remain key areas of uncertainty and research. The 110th Congress may examine how the federal government considers climate change in its decisions on how to develop, manage, and protect the nation's resources.

A changing climate may influence a wide range of natural resource management issues. Higher temperatures and, in some regions, dryer conditions will have implications for some federal forests, particularly their resistance to pest infestation and susceptibility to fire. Forest productivity also may be enhanced in some regions. Changing growing seasons and an intensifying hydrologic cycle may affect the condition of federal rangelands, increasing or decreasing their productivity and nutritional quality, and altering their susceptibility to invasive and noxious species, for example. Rising sea levels could exacerbate challenges for coastal resource management. Sea level rise, coupled with the potential for increased frequency and intensity of severe storms, may complicate existing multi-use conflicts in coastal regions between

human activities and protection of natural resources. Warming sea temperatures could, for example, lead to increased coral bleaching. Exacerbation of drought and flood threats, changes in snowpack and snowmelt timing, and other changes in water supply and availability may have multiple impacts—both positive and negative—on the sustainable use of the nation’s water resources and operations of federal infrastructure. Similarly, these changes to the hydrologic cycle, sea level rise, as well as other climate-related factors may influence the performance of large-scale ecosystem restoration, such as the \$11 billion federal-state effort to restore the Florida Everglades.

Natural Disaster Mitigation

An ongoing issue for Congress is whether to modify the current federal role in natural disaster mitigation. Federal activities, programs, and regulations that pertain to natural disaster mitigation and that enhance community sustainability include federal disaster assistance programs (whose structure and administration are informed by mitigation principles), both pre- and post-disaster mitigation grant programs, mandates under the National Flood Insurance Program, and flood map modernization efforts. (See “Mapping Data Management and Natural Hazards.”)

Hazards are consequences of both the physical and social systems and interaction between them. Implementing policies to mitigate risk can avert or lessen the impact of natural hazards. Recent amendments to the Robert T. Stafford Disaster Relief and Emergency Assistance Act may influence the role of mitigation in natural disaster management. The 110th Congress may evaluate the scope and effect of the amendments on mitigation. Mitigation of natural hazards can include (1) structural measures, such as construction of dams, or making the structure more resistant or resilient to specific hazards, such as wind or earthquakes through reinforcement (retrofitting) or modification, and (2) nonstructural options, such as land use regulation, zoning laws, and building codes. The 110th Congress also may evaluate the effectiveness of two multi-agency programs: the National Earthquake Hazards Reduction Program and the National Windstorm Impact Reduction Program.

The 110th Congress also may address through legislation and oversight Hurricane Katrina recovery efforts. Congressional debates over policy choices are likely to be shaped by assessments of the long-term viability of investments in coastal Louisiana, as well as benefits and costs of mitigation activities, such as levee construction and wetlands restoration.

Mapping Data Management and Natural Hazards

New and updated hazard maps can be generated rapidly, since the advent of electronic instruments that generate digital mapping data and the geographic information system (GIS) which can manage and manipulate spatial (geographic) data. These computer-generated maps can assist decision-makers, scientists, engineers, and emergency managers in identifying potential natural hazard risks, such as of flooding, seismic damages, or landslides. They can assist emergency managers in evacuating populations, and governments and policy makers in making informed decisions about future development and land use.

Federal agencies are subject to government-wide standards for spatial (geographic) data management, including digital storage, access, and mapmaking. The 110th Congress might consider whether to authorize a spatial data clearinghouse to centralize federal mapping data to facilitate access. The Clinton Administration proposed a “National Spatial Data Infrastructure.” The Bush Administration supports the “Geospatial One-stop,” to make all federal *geospatial* data accessible on a centralized website. However, the Administration has not requested dedicated funding for the initiative, and appropriations have not been provided.

FEMA operates a large-scale digital mapping program—the Flood Map Modernization Initiative. The National Flood Insurance Program gave FEMA responsibility for identifying potential flood hazard risks and creating maps to enhance the awareness of such risks in emergency planning, to inform land use and development, and to determine national flood insurance requirements. New flood maps, and those requiring revision as flood risks change, currently are produced digitally. These maps are more accurate in defining flood risks and more precise in locating risks and potentially affected structures. Recent major floods in coastal and riverine areas of the northern Gulf Coast states of Louisiana and Mississippi have increased demand for flood map updates so that affected communities can be assessed for flood insurance requirements. The 110th Congress may consider whether FEMA has the necessary resources and authorities to meet these demands, and whether the FMMI is keeping pace in identifying new flood risk and providing for updates elsewhere.

Weather, Atmospheric Research, and Environmental Observations

Much of U.S. weather and climate research is performed by NOAA. A question for Congress is how to ensure continuity of NOAA's observations, services, and research. Some Members support an organic act for NOAA as a way to organize vital oceanic and atmospheric research programs and protect funding for such programs, human resources, and facilities at the agency. Some NOAA officials believe that such an act would limit the agency's flexibility to change its organizational structure to meet its changing mission.

NOAA's research supports operational activities such as weather forecasts and warnings. NOAA's climate services advise U.S. transportation and agricultural sectors on long-term weather outlooks and short-term climate variation. The scientific community relies on NOAA's environmental data for research validation. The public depends on continuity of critical weather and environmental observations and NOAA's daily operations and services. Climate research at NOAA includes detecting change and projecting possible impacts, and informs national and international assessments of change in the climate and global environment. NOAA operates critical instruments and sensors which collect and analyze environmental data, acquired from satellite observations and ground-based sensing technologies. Such technologies have served in detecting natural or man-made disasters, identifying natural hazard risk potential, and assessing post-disaster damages.

Ocean and Coastal Affairs

Conceptual Framework

Use of coastal and marine resources is increasing, and Congress may consider proposals that alter the relationship between resource use and protection. Two reports issued in 2004—by the Pew Oceans Commission and the U.S. Commission on Ocean Policy—noted declines in marine resources and shortcomings in the fragmented and limited approaches to resource protection and management in federal and state waters. Both reports called for bold responses from Congress and the Administration. The 109th Congress considered legislation related to specific ocean and coastal issues and comprehensive bills encompassing a broad array of management, policy, and institutional crosscutting concerns. The combination of more information about ocean and coastal issues, new recommendations on how these issues might be addressed, and expired authorities for appropriations to fund ocean programs may cause the 110th Congress to give attention to these topics.

Coastal Resources

The country's coastal counties are only 17% of the land area, but they are home to about 50% of the country's population and jobs. These people and jobs are most heavily concentrated along the highly desirable shoreline portion of most coastal counties, where development can displace or disrupt beach systems, wetlands, estuaries, and other highly productive natural systems. Many sustainability and multi-use public policy issues in shoreline areas involve conflicts between human activities and protection of natural systems. These conflicts may increase in number and intensity as people and jobs continue to concentrate in these portions of coastal counties. Hazardous natural forces—strong winds, large waves, and flooding, for example—are also most intense in these same shoreline areas. Numerous hurricane landfalls in recent years, especially Hurricane Katrina in 2005, have brought the public policy challenges of expanding coastal development into sharper focus.

The coastal zone management program is the central federal effort for coordinating coastal development with natural resource management and policies. The authorization for the program's appropriations expired at the end of FY1999, and the 110th Congress, like earlier ones, may consider reauthorization legislation and possibly changes that would address emerging issues. This program provides federal grants to assist states and territories in administering federally approved plans for development and protection. Statutory and regulatory guidance gives the 35 eligible states and territories considerable latitude as to which topics they emphasize. The program also gives participants leverage over federal actions in or affecting the coastal zone by requiring those actions to be consistent with approved plans. Congress also may consider legislation for specific coastal and shoreline areas, such as coastal Louisiana and the Great Lakes, and for specific resources, such as coastal barrier beaches, wetlands, and estuaries. Many federal programs that apply more broadly have significant coastal components, such as resource protection programs for seashore units of the National Park System and refuge units in the National Wildlife Refuge System, and disaster mitigation response programs such as the National Flood Insurance Program.

Fishery and Marine Mammal Policy

The two ocean policy reports, discussed in the conceptual framework for this section, expressed concern over U.S. management and use of fish and marine mammals. These reports recommended measures to address declining fish stocks, to protect marine mammal populations, and to improve the sustainability and competitiveness of the U.S. commercial fishing industry. The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) authorizes federal management of fishing in waters of the U.S. Exclusive Economic Zone beyond state jurisdiction to 200 miles offshore, and was reauthorized in the closing hours of the 109th Congress (P.L. 109-479). During the 110th Congress, action may focus on oversight of Magnuson-Stevens Act implementation as well as measures to protect and restore fishery habitat.

The Marine Mammal Protection Act (MMPA) prohibits taking of marine mammals unless permitted under several programs. Authorizations of appropriations for the MMPA have expired. The 110th Congress may consider legislation to reauthorize and amend the MMPA, incorporating some of the recommendations of the two ocean policy reports. Topics of debate for amending the MMPA could include modifying management of commercial fishing interactions, robust wild stocks, and captive marine mammals. Actions fostering international cooperation on managing marine mammal populations also may be considered. Discussions of regulatory changes may encompass subsistence use of marine mammals by Native Americans, effects of underwater noise of human origin, and incidental takes of marine mammals.

Marine Habitat Protection and Management

There is growing recognition of the complex relationships among ocean uses, marine environmental quality, and marine resources. As the variety and magnitude of human activities expand in the ocean, estuaries, and adjacent coastal areas, environmental quality in some areas has declined and habitat has been altered. Related policy issues are sometimes broad in scope because causes and impacts are numerous and diverse; may occur over broad spatial and temporal scales; and often involve local, state, and federal authorities. For example, impacts may involve relatively narrow issues, such as potential impacts of active military sonar on marine mammals, or broader concerns, such as oil spill impacts on marine ecosystems.

The 110th Congress may address a variety of marine habitat protection and management issues. Issues of continuing interest include invasive species, oil spills, marine dead zones, chemical weapons disposal, and cruise ship pollution. Invasive species concerns may focus on ballast water management, with continued oversight of National Invasive Species Act implementation. Several bills related to ballast water management received attention in the 109th Congress but were not enacted. Another key issue is whether existing U.S. laws adequately address cruise ship pollution. The 110th Congress also may consider control and monitoring of wastewater discharges from large passenger vessels. Although oil spill incidents and volume have decreased despite increased oil consumption, Congress may review the adequacy of response actions to oil spills. There has been increasing support for the use of marine protected areas (MPAs) to protect and manage ocean resources. However, MPAs may restrict uses such as commercial and recreational fishing that provide economic and social benefits to local communities and the national economy. The 110th Congress may conduct oversight related to the use of MPAs and the adequacy of related federal law. Finally, environmental activities of the Coast Guard, such as enforcement, also may be a topic of congressional oversight.

Ocean Energy Resources

The combination of high oil prices, technological advancement, and tax incentives is driving interest in increasing development of offshore energy resources. Offshore energy resources being considered include oil and gas on the Outer Continental Shelf (OCS), and proposals for wind energy along the mid-Atlantic, northeast, and Texas coasts. The 110th Congress may examine the balance between developing energy resources and other offshore uses such as commercial fishing, recreational boating, and tourism. Offshore energy development raises questions about its effects on marine and air traffic navigation, military and civilian radar, and the environment. Congress also may consider federal regulatory and permitting responsibilities for new development projects and examine the potential conflicts between the federal interest in offshore energy and state and local interests.

The U.S. Gulf of Mexico has been identified by the Energy Information Administration as the most promising region for new additions to U.S. oil reserves. The Minerals Management Service projects that by 2011 Gulf oil production could be 50% higher than current production, while natural gas production could double. These forecasts assume that current leasing moratoria will be retained for certain areas. The moratoria were imposed in response to economic and environmental concerns over drilling near coastal communities. The industry is interested in accessing areas under moratoria, and the 110th Congress may again consider proposals to repeal the moratoria. P.L. 109-432 made available for exploration 8.3 million acres in the Gulf of Mexico, and made available offshore leasing revenues to selected coastal states—Texas, Louisiana, Mississippi and Alabama—and the Land and Water Conservation Fund. P.L. 109-432 also codified the offshore moratorium in nearly all of the Eastern Gulf of Mexico until 2022.

In early 2006, the *New York Times* reported that the MMS would not collect royalties on oil and gas leases awarded in 1998 and 1999 because price thresholds were not in those lease agreements.⁶ The price threshold is the price per barrel of oil or per million BTUs of natural gas above which lessees would be required to pay royalties to the federal government. The MMS asserts that placing price thresholds in lease agreements is at the discretion of the Secretary of the Interior, that price thresholds were omitted by mistake, and that discussions are on-going to amend leases to include price thresholds. The 110th Congress is examining the MMS royalty relief and royalty compliance programs through legislation and oversight.

All commercial U.S. wind farms currently are operating onshore. Several proposed offshore projects, such as the Cape Wind project off the Massachusetts coast, are undergoing the permitting process. The federal government's handling of the Cape Wind proposal and other proposed offshore wind energy projects may influence the viability of offshore alternative energy projects.

Ocean Research, Operations, and Services

NOAA conducts many programs and activities related to oceans, coastal areas, and the Great Lakes. The agency's so-called *wet* programs include U.S. fishery management; marine endangered species protection; coastal and estuarine area conservation, recreation, and education; marine species habitat protection; ocean observation and monitoring of marine environmental health; hazard response and recovery in coastal communities; scientific research in the coastal ocean; and deep ocean exploration that yields scientific discovery as well as marine-products development. NOAA also operates the National Sea Grant College Program, in conjunction with state Sea Grant programs, to train future marine scientists and engineers. All of these programs are funded under the Department of Commerce appropriations. (For other NOAA programs related to atmospheric research and weather, and the agency in general, see "Weather, Atmospheric Research, and Environmental Observations.")

Since the December 2004 tsunami in the Indian Ocean, NOAA's National Weather Service (NWS) has had an enhanced role domestically, by expanding its detection capabilities to protect U.S. and trust territories' shores. The agency also is assisting affected nations around the Indian Ocean through international organizations by lending detection technology and providing communication equipment and planning assistance. With such networks in place, how to provide resources for long-term operations and maintenance may be an implementation issue for Congress both in terms of domestic needs and U.S. involvement in international protection programs.

U.N. Convention on the Law of the Sea

The 1982 United Nations Convention on the Law of the Sea and the 1994 Agreement Relating to Implementation of Part XI of the United Nations Convention on the Law of the Sea remain pending before the Senate Committee on Foreign Relations. The Convention, which established a legal regime governing activities on, over, and under the world's oceans, has entered into force, with more than 150 states parties. The United States is not a party. Since receiving the treaty from the President in October 1994, the Committee held hearings in October 2003 and, in February 2004, recommended that the Senate give its advice and consent to U.S. adherence. However, the treaty was not considered by the full Senate and was returned to the Committee.

⁶ Edmund L. Andrews, "U.S. Royalty Plan to Give Windfall to Oil Companies," *The New York Times*, Feb. 14, 2006, p. A1.

A prerequisite for possible Senate action either to approve, disapprove, or not act on the treaty in the 110th Congress is further Committee consideration and its favorable recommendation for Senate advice and consent to U.S. adherence. An issue is whether those who oppose U.S. participation in this Convention might seek to prevent consideration. The Bush Administration supports U.S. adherence, as did the U.S. Commission on Ocean Policy and does the Joint Ocean Commission Initiative. Among assertions presented in support of U.S. adherence: participation would protect U.S. interests during ongoing deliberations by the Commission on the Limits of the Continental Shelf, which was created by the Convention, and enable the United States to submit its own limits; and participation would enhance U.S. efforts to amend the Convention. Some opponents to U.S. adherence assert that participation in the Convention would be contrary to U.S. national security interests, especially as the United States carries out its counter-terrorism programs, such as the Proliferation Security Initiative. Opponents to adherence also maintain that concerns related to the parts of the Convention that dealt with deep seabed resources beyond national jurisdiction and raised in 1982 by the Reagan Administration were not corrected by the 1994 Agreement; they are also concerned over the extent to which adherence would infringe on U.S. sovereignty.

Species Management and Ecosystem Protection

Conceptual Framework

Wildlife and their habitats are addressed by laws that generally aim to manage, protect, and restore species, populations, and the ecosystems upon which they depend. For example, there are laws to protect species that face extinction by aiding their recovery and protecting habitat; and certain agricultural conservation laws to conserve water quality and wildlife habitat. The implementation of these laws sometimes generates controversy because the needs of species and ecosystems sometimes conflict, or are thought to conflict, with other social and economic interests and uses. These conflicts lead to calls to reassess programs and their implementation.

These laws address issues at both national and local scales. Federal programs with national-level objectives generally have a significant federal role in setting goals and objectives. In contrast, some programs with local or regional perspectives are developed and implemented with greater input from state and local governments and stakeholders. Balancing national and regional interests and multiple uses of the nation's resources and ecosystem often pose challenges to implementing and governing wildlife and ecosystem programs, and Congress seeks to bridge competing interests. The 110th Congress may address these issues through oversight of the implementation, progress, and funding of various wildlife and ecosystem programs and laws. Regional issues regarding endangered and threatened species, invasive species, and ecosystem restoration initiatives, as well as national issues, such as wetlands protection and agricultural conservation, also may be considered.

Ecosystem Restoration

In the last 25 years, the United States has devoted substantial effort to, and spent billions of dollars on, restoring some large ecosystems, such as the Florida Everglades, the Chesapeake Bay, and the San Francisco Bay and Sacramento and San Joaquin Rivers Delta (California Bay-Delta). Many of these efforts have multiple objectives and benefits, such as improving water supply and conveyance, and managing natural resources and watersheds. The 110th Congress may address restoration-related policy issues at these and other locations. Policy issues range from the allocation of natural resources (e.g., agricultural and municipal water), to governance and funding of restoration initiatives, to the science supporting restoration.

The 110th Congress may consider authorizing additional activities for ongoing ecosystem restoration efforts in the Upper Mississippi River System, Puget Sound, Great Lakes (also discussed in “Transboundary Water Resources”), and coastal Louisiana (also discussed in “Wetlands Protection and Restoration”). For example, the 110th Congress may consider authorizing a regional strategy for restoring the Great Lakes. One proposal was released in December 2005, calling for a \$20 billion investment in restoration over the next five years. The 110th Congress also may consider a Water Resources Development Act (see “Agency Management and Water Resources Policy”), which may contain provisions that authorize restoration activities in coastal Louisiana and other regional ecosystems. Oversight of ecosystem restoration also may occur in the context of broader resource issues, such as the potential impact of climate change on restoration activities.

Endangered Species

The Endangered Species Act of 1973 (ESA) has been one of the more contentious environmental laws. This may stem from its strict substantive provisions, which can affect the use of both federal and nonfederal lands and resources. Under ESA, species of plants and animals can be listed as *endangered* or *threatened* according to assessments of their risk of extinction. Once species are listed, powerful legal tools are available to aid their recovery and to protect their habitat. ESA also may be controversial because dwindling species usually are harbingers of resource scarcity or degradation—the most common reason to list a species is habitat loss. Authorization for spending under ESA expired on October 1, 1992. The prohibitions and requirements of ESA remain in force, even in the absence of authorization, and funds have been appropriated to implement the administrative provisions of ESA in each subsequent fiscal year. The 109th Congress considered several proposals to amend ESA. Policy questions expected to continue into the 110th Congress include changes to the role of science in decision-making; changes to the definition, extent, and process for designating critical habitat; further protections for private property owners’ interests; and incentives for increased landowner protection of listed species.

International Species Protection and Conservation

The United States is involved in conserving foreign species and natural areas through various laws and international treaties, such as ESA and the Convention on International Trade in Endangered Species (CITES). CITES is an international agreement that aims to ensure that the trade in plants and animals does not threaten their survival. The ESA protects foreign endangered species by limiting or banning their import into the United States, and implements CITES. Overall, ESA has a more comprehensive approach to foreign species protection than CITES. For example, ESA protects species based on several criteria that may threaten their survival, whereas CITES protects species based solely on the threat of trade to survival.

The 110th Congress may conduct oversight on the implementation of ESA as it relates to the listing and protection of foreign threatened and endangered species. The fourteenth meeting of the Conference of the Parties under CITES is set for June 2007 and Congress may hold hearings to address potential issues of discussion at the Conference. International protection, management, and sustainability issues for congressional oversight may include the implementation of the Tropical Forest Conservation Act, illegal logging activities, and the conservation of international fisheries.

The United States also assists in the conservation of some high-visibility foreign species (e.g., tigers and elephants) by providing funds for conserving their populations and habitat through the Multinational Species Conservation Fund. The United States further promotes the conservation of

tropical forests in developing countries, most notably through debt-for-nature transactions under the Tropical Forest Conservation Act.

Invasive Species

Non-native species, introduced accidentally or intentionally, can cause both ecological and economic damage. The 110th Congress may weigh whether new legislative authorities and additional funding are needed to address issues of non-native species and their increasing economic and ecological impacts. A major unanswered question is who should be responsible for ensuring economic integrity and ecological stability in response to the actual or potential impacts of non-native species. In addition to the possible aid to natural resources previously damaged by non-native species,⁷ legislation could help or harm many economic interests, including domestic and international trade and tourism, industries dependent on bringing in non-native species, and those dependent on keeping them out. Additional policy considerations include the balance between prevention and response, overlapping jurisdiction of congressional committees, and coordination of the many agencies and levels of government dealing with invasive species.

The congressional response to problems posed by harmful non-native species generally has been to address specific non-native species, such as brown tree snakes on Guam and impure seed stocks. A few notable efforts have begun to address specific pathways (e.g., ship ballast water through the Nonindigenous Aquatic Nuisance Prevention and Control Act), but no current law addresses the general concern over non-native species and the wide variety of paths by which they enter this country. In the 109th Congress, while hearings were held on several invasive species matters, committee action focused on ballast water and invasive carp species.

Private Land Conservation

Natural resource management and policy challenges related to private lands that attract congressional attention are many and varied. Some center on the effects of private land uses on natural resources, especially on agricultural lands in rural areas. Agricultural production occupies about 41% of the land in the coterminous United States, according to the National Agricultural Statistics Service in the Department of Agriculture (USDA). Production techniques can contribute to resource problems such as soil erosion, pesticide and nutrient runoff, air pollution, and loss of wildlife habitat. USDA administers voluntary programs which provide technical assistance, cost-shared funds, education, and research to help farmers address these problems. Some programs pay producers to retire lands from production that have high resource values, such as wetlands, while other programs help producers grow crops in ways that protect resources or environmental conditions. USDA has initiated a program to more precisely measure the resource and environmental accomplishments of conservation programs. Many of these conservation programs expire at the end of FY2007. The 110th Congress may consider whether and in what form to reauthorize them during the farm bill.

Another resource challenge is associated with residential and other development in rural areas that are within commuting distance of cities. This development can contribute to declines in habitat and environmental quality. Although this development is largely managed by local and state governments, Congress can act to limit, guide, or foster growth through programs that help fund construction of roads, sewer and water infrastructure, and public facilities. Congress also can influence landowner choices by providing federal funds to acquire easements on land to maintain its habitat, farmland, or other desired uses, and through tax policies that reward individuals who

⁷ Aid might include, for example, assistance in restoring water flow by removal of tamarisk trees, improving forage by controlling toxic plants, and protecting native fishes by removing snakehead fish in the Chesapeake Bay.

take specified land- or resource-conserving actions. Growth also could be addressed in measures that designate sites for particular uses or forms of protection, or that provide guidance for federal projects and facilities.

Resource management and use conflicts can occur when private and public ownership abut. At these locations, land use and resource protection goals may be incompatible, leading to conflicts over such topics as weed and predator control and habitat for species. At the same time, private landowners often contend that public land management is inconsistent with their goals, and managers are unresponsive to their concerns. Congress has discussed some of these topics, largely on a case-by-case basis, but may look for systematic policy responses when addressing larger areas, such as watersheds, landscapes, or ecosystems.

Wetlands Protection and Restoration

The coterminous United States now has about 108 million acres of wetlands, less than half of the estimated 220 million acres that were present when the Europeans arrived, according to a 2006 Fish and Wildlife Service survey. These reductions were encouraged by federal policies in place through the late 1970s because wetlands were viewed as having little use or value; these policies encouraged conversion to other uses, primarily agricultural production. During the past 25 years, federal policies have been revised, and now seek to retain and restore wetlands for their many resource values. Starting with George H. W. Bush, Presidents have articulated a goal of either no-net-loss or net-gain of wetlands. The current Bush Administration announced wetland protection as a priority during the current term, with a goal of restoring or improving 3 million acres.

The 110th Congress may continue past efforts to encourage wetlands protection. However, the emphasis may change from recent Congresses, which focused on conflicts between the rights of landowners and protection efforts (almost 75% of all wetlands are on private lands). The 110th Congress may hold oversight hearings on topics including the implementation of the permit program (under §404 of the Clean Water Act) by the Army Corps of Engineers, federal acquisition and easement programs, and the role of wetlands in large-scale restorations in the Florida Everglades and elsewhere. Perennial issues involve changes in wetland acreage, including where wetlands are being lost or gained; how different types of wetlands are affected by protection efforts; and the effectiveness of various protection approaches and programs. Ecosystem restoration in coastal Louisiana, which involves restoring existing wetlands and creating new ones, has attracted increased interest since Hurricane Katrina in 2005. Wetlands are believed to play important roles in buffering developed coastal areas from some storm surges.

Wild Birds and Bird Flu

Avian influenza is a virus that primarily infects birds, both domestic and wild. Certain strains of avian flu break the avian barrier and have been known to infect other animals and humans. Avian flu viruses are common among wild bird populations, which act as a reservoir for the disease. While rarely fatal in wild birds, avian flu is highly contagious in domestic poultry, prompting strict biosecurity measures on farms. A strain of highly pathogenic avian influenza (H5N1) has spread throughout Asia since 2003, infecting mostly poultry, some wild birds, and a limited number of humans through close domestic poultry-to-human contact. The mortality rate among the more than 250 people infected so far has exceeded 50%. Fears that the virus could mutate to allow efficient human-to-human transmission and cause a human pandemic have prompted a global political and public health response. The virus reached Europe in 2005, and the Middle East and Africa in early 2006.

Veterinary and medical health officials believed the highly pathogenic strain might enter North America in the summer of 2006 with the arrival of asymptomatic wild breeding birds which had spent the winter of 2005-2006 in southern Asia or the tropical Pacific. Because wild birds are relatively resistant and reports of deaths among wild birds due to avian flu are very rare, testing is essential to any detection effort. As a result of the threat, several federal agencies (including the Fish and Wildlife Service and the U.S. Geological Survey in DOI), and state, tribal, and local governments increased surveillance among wild birds for the highly pathogenic H5N1 virus in 2006. Though the surveys occasionally detected a different, low pathogenicity strain of H5N1 among these bird populations, the highly pathogenic strain has not yet been detected. The low pathogenicity strain does not pose the same threat as highly pathogenic H5N1. The continued testing of wild birds is expected to be a major effort in coming years. Oversight of agency priorities and activities, as well as funding levels for the federal program, might be issues during the 110th Congress.

Water Resources

Conceptual Framework

The federal government has had a long history of involvement in surface water resource issues, from assisting with navigation and defense activities in the early days of the Republic, to later assisting states and localities with development projects for irrigation, flood control, and hydropower. While the federal government has traditionally deferred to the states on issues of surface water allocation and use (i.e., how much water may be used and where), numerous federal statutes and federally constructed and owned facilities affect allocation decisions and overall management of the nation's surface waters. Groundwater management has been left primarily to states, although federal statutes apply to its use for drinking water supplies and seek to protect its quality.

The 110th Congress is faced with numerous decisions about the nation's water resources, ranging from site-specific project authorizations to changes in the federal role in water resources management. Congress plays a major role in water resources through its authorizations of and appropriations for regional and site-specific activities. Congress makes these decisions within the context of multiple and often conflicting objectives, competing legal decisions, and long-established institutional mechanisms (e.g., century-old water rights, contractual obligations, etc.). Federal water resources planning, management, and development activities are spread among several congressional committees, and among many federal departments, agencies, and bureaus. Because of growing tensions related to water allocation and use, changes in river management, concerns about flood risk, and the viability of existing and new water projects, the 110th Congress is likely to face many water resources issues. Bills that were acted on, but not enacted, in the 109th Congress—a Water Resources Development Act (WRDA), water reuse program and project-specific legislation, bills related to a legal settlement on San Joaquin River (CA) restoration, and more—may receive attention during the 110th Congress.

Agency Management and Water Resources Policy

Federal water resource construction activities shrank during the last decades of the 20th century. Fiscal constraints, changes in national priorities and local needs, few remaining prime construction locations, and environmental and species impacts of construction all contributed to this shift. Although these forces are still active, there are proposals for greater federal financial and technical assistance to address growing pressures on developed water supplies and to manage regional water resources to meet demands of multiple water uses.

The 110th Congress may consider authorizing hundreds of site-specific Army Corps of Engineers (Corps) projects through WRDA. Prominent policy issues in the WRDA debate are independent review requirements for Corps studies and proposals to change the policies and procedures that guide the Corps' project development. Proposed authorizations of high-profile, multi-billion dollar projects (e.g., Gulf Coast hurricane protection and coastal Louisiana wetlands restoration, and the Upper Mississippi River navigation lock expansion and ecosystem restoration) and their effect on the agency and its backlog of projects also may well continue to be part of the WRDA debate. Whether policy and program changes are needed to set priorities among the Corps' backlog of construction projects and maintenance activities is a topic of debate both in the context of WRDA and annual agency appropriations.

The Bureau of Reclamation operates hundreds of federal dams, reservoirs, and water distribution facilities throughout the western states. Perennial matters for Congress involve appropriations for authorized construction and maintenance activities. Other possible topics for the 110th Congress involve project management and operations—particularly how project operations and water contract renewals may affect threatened and endangered species, and how requirements to alter project operations for species protection may affect long-term water users. Overarching legislation to address water and restoration issues in California (CALFED) was enacted at the end of the 108th Congress. CALFED-related activities, such as progress on storage projects and federal spending, as well as efforts to increase pumping and renew long-term contracts, continue to be the subject of congressional oversight.

Dams and Levees

Recent disasters have brought attention to the safety and security of the nation's water resources infrastructure, including its dams and levees. Age, construction deficiencies, inadequate maintenance, and natural disasters may undermine the structural integrity of these projects, which fall under the auspices of dam safety programs. Preventing deliberate damage is generally considered a security issue. Existing structures are aging and require increasing maintenance and repair to perform their intended functions, such as reducing flood damages, facilitating navigation, storing irrigation water, and generating electricity. Interest in, and examples of, removal of existing dams for safety, economic, or environmental reasons has been growing in the last decade. While the nation's more than 79,000 federal and nonfederal dams provide the benefits of flood control, navigation, power generation, and irrigation water, they also pose risks. Approximately 10,000 U.S. dams are considered high-hazard dams, meaning that loss of life and significant property damage is probable in the event of failure. Immediately prior to adjournment, the 109th Congress authorized continued funding of the National Dam Safety Program at an average of \$9.6 million per year through FY2011 (P.L. 109-460). The 110th Congress may reauthorize programs for dam safety, rehabilitation, and removal.

Hurricane Katrina prompted interest in improving the reliability and level of protection provided by the nation's 15,000 miles of flood damage reduction levees, particularly those protecting concentrated urban development and population centers. The federal agencies most involved in levee issues are the Army Corps of Engineers and FEMA. The Corps performs most of the federal inspections of levees, to determine eligibility for federal assistance for repairing levees damaged during floods, and to certify a levee's protection for a 100-year flood under the National Flood Insurance Program as administered by FEMA. Oversight topics may include levee inspection and certification as stricter post-Katrina inspections are resulting in a number of levees being decertified, and levee and other flood risk management issues for communities with high flood risk (e.g., Sacramento, CA). Legislative proposals for a national levee safety program similar to those proposed in the 109th Congress also are anticipated.

River Management

Existing arrangements for river management and water use are being challenged by natural disasters and related damages, Indian water rights claims, drought conservation and preparedness measures, and judicial decisions affecting water allocation (e.g., decisions requiring management changes to support habitat for federally listed threatened and endangered species). River management may receive congressional and public scrutiny during the 110th Congress. Rivers provide not only economic benefits—navigation, flood protection, and water supply for agriculture and municipalities—but also recreational opportunities, natural habitat, and other services. Increasingly, a central management question is how to balance or prioritize uses and related infrastructure and mitigation investments, while satisfying existing water rights and contractual obligations, especially during drought.

In many cases, Bureau of Reclamation or Corps of Engineers facilities and their operation are central to debates over sustainable management of multi-purpose rivers. Other federal agencies also have a stake in river operations, such as the Federal Energy Regulatory Commission (FERC) that licenses nonfederal hydropower dams, and the four power marketing administrations (PMAs) that market the hydropower generated by federal dams. Actions by these federal agencies remain controversial on the Middle Rio Grande, Colorado, Klamath, Columbia, Snake, Mississippi, and Missouri Rivers and frequently are challenged in the courts. Oversight of existing laws, federal projects and decisions, and river management practices is expected, especially in cases of court decisions, agency actions, climate variability, or other circumstances challenging existing basin management regimes. Congress also may consider settling Indian water rights for specific river basins and tribes.

Transboundary Water Resources

U.S. boundary waters—water basins and aquifers shared by the United States and Canada or Mexico—often present contentious resource management issues, including water pollution, water withdrawals, and ecosystem restoration. International cooperation sometimes is hindered by competing economic interests, differences in governance, and varying levels of environmental and human health protection. In Southern California, litigation surrounding the lining of the federally owned All-American Canal has raised a number of legal and environmental issues, resulting in the halting of the project. For decades, Mexican farmers have irrigated their crops with water that seeps from the unlined canal into an aquifer that straddles the border.

Environmentalists claim that the unlined canal nourishes a wetland south of the border. In the last days of the 109th Congress, legislation was enacted (P.L. 109-432) with provisions directing the Secretary of the Interior to carry out the lining project “without delay.” The All-American Canal may continue to be of interest to the 110th Congress.

Congressional attention also may focus on the nation’s largest shared freshwater resource—the Great Lakes. A concern for the 110th Congress is the potential for water withdrawals from the Great Lakes and their effects on the environment and surrounding population. On December 13, 2005, the Council of Great Lakes Governors—a partnership of the governors of the eight Great Lakes states and the Canadian provincial premiers of Ontario and Quebec—released a final agreement and compact among themselves to create uniform water withdrawal standards. Some have questioned whether the agreement and compact will truly limit water diversions. The compact needs to be approved by each of the eight state legislatures, as well as by Congress, to achieve full legal force.

Western Water Availability and Drought

Increasing pressures on the quality and quantity of available water supplies—due to growing population, environmental regulation, in-stream species and ecosystem needs, water source contamination, agricultural water demand, climate variability, and changing public interests—have resulted in heightened water use conflicts throughout the country, particularly in the West. These factors, coupled with the severity of recent drought in much of the West, have fostered interest in new water supply development, supply augmentation, and security of water supplies. Historically, local, regional, or state agencies generally have been responsible for municipal water supply, and have been wary of federal involvement in allocating water. Both urban and rural communities, however, increasingly have come to Congress for financial assistance with water reuse and rural water supply projects. Urban communities have sought financial assistance with new technologies to augment water supply, primarily through desalination of seawater and brackish groundwater and municipal wastewater reclamation and reuse, and have sought water transfers to bolster existing supplies. Traditional users of water supplied by federal facilities (mainly for irrigation) often are wary of new water supply activities that may compete with limited federal funds or result in reduced deliveries to farms.

Issues that may receive oversight in the 110th Congress include the extent to which water transfers are occurring in the West, status of transfers of title to Bureau of Reclamation facilities, potential climate impacts on reservoir operation and water supply planning, and implementation of the Central Valley Project Improvement Act (e.g., contract renewals, tiered pricing, and fish and wildlife water). Other more programmatic issues may include the status of Reclamation's 2025 Water in the West program; reconsideration of new authorization language for the Title XVI water reuse program; possible early implementation of a new rural water supply program; and federal efforts to assist communities with drought awareness, planning, and coordinated information. Other policy questions for the 110th Congress include how new municipal water supply activities mesh with the historical federal role in municipal water supply and existing federal programs to assist communities, and perhaps what is the future role of Reclamation and other federal agencies in an urbanizing and drought-prone west.

Selected CRS Products

Federal and Indian Lands and Resources

CRS Report RL33523, *Arctic National Wildlife Refuge (ANWR): Controversies for the 109th Congress*, by M. Lynne Corn, Bernard A. Gelb, and Pamela Baldwin.

CRS Report RL33792, *Federal Lands Managed by the Bureau of Land Management (BLM) and the Forest Service (FS): Issues for the 110th Congress*, by Ross W. Gorte et al.

CRS Report RL33484, *National Park Management*, by Carol Hardy Vincent, Ross W. Gorte, and Sandra L. Johnson.

CRS Report RS22056, *Native American Issues in the 109th Congress*, by Roger Walke.

Natural Hazards, Climate, and Earth Science

CRS Report RL33053, *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding*, by Keith Bea.

CRS Report RL33264, *FEMA's Flood Hazard Map Modernization Initiative*, by Wayne A. Morrissey.

CRS Report RL33602, *Global Climate Change: Major Scientific and Policy Issues*, by John R. Justus and Susan R. Fletcher.

Ocean and Coastal Affairs

CRS Report RL33459, *Fishery, Aquaculture, and Marine Mammal Legislation in the 109th Congress*, by Eugene H. Buck.

CRS Report RL33493, *Outer Continental Shelf: Debate Over Oil and Gas Leasing and Revenue Sharing*, by Marc Humphries.

CRS Report RS21890, *The U.N. Law of the Sea Convention and the United States: Developments Since October 2003*, by Marjorie Ann Browne.

Species Management and Ecosystem Protection

CRS Report RL31975, *CALFED Bay-Delta Program: Overview of Institutional and Water Use Issues*, by Pervaze A. Sheikh and Betsy A. Cody.

CRS Report RS22276, *Coastal Louisiana Ecosystem Restoration After Hurricanes Katrina and Rita*, by Jeffrey A. Zinn.

CRS Report RL33779, *The Endangered Species Act (ESA) in the 110th Congress: Conflicting Values and Difficult Choices*, by Eugene H. Buck et al.

CRS Report RL33483, *Wetlands: An Overview of Issues*, by Claudia Copeland.

Water Resources

CRS Report RL30478, *Federally Supported Water Supply and Wastewater Treatment Programs*, coordinated by Claudia Copeland.

CRS Report RL33565, *Western Water Resource Issues*, by Betsy A. Cody and Pervaze A. Sheikh.

CRS Report RL33504, *Water Resources Development Act (WRDA) of 2007: Corps of Engineers Project Authorization Issues*, by Nicole T. Carter et al.

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Marc Humphries	Energy resources on federal lands
Sandra Johnson	Trails and rivers
Adam Vann	Energy and natural resources legal issues
Roger Walke	Indian lands and resources
David Whiteman	National Park Service
<i>Natural Hazards, Climate, and Earth Science</i>	
Peter Folger	Climate change and natural hazards
Natalie Love	Natural disaster mitigation
Wayne Morrissey	Natural hazards and earth sciences
<i>Ocean and Coastal Affairs</i>	
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Eugene Buck	Fish and marine mammals
Peter Folger	Wind and tidal energy
Marc Humphries	Offshore oil and gas
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Harry Upton	Living marine resources
Jeffrey Zinn	Coastal zone
<i>Species Management and Ecosystem Protection</i>	
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M. Lynne Corn	Terrestrial species
Pervaze Sheikh	Ecosystem restoration, international species

Jeffrey Zinn	Wetlands, private land conservation
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Water Resources

Nicole Carter	Army Corps authorizations, water research
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Peter Folger	Groundwater
H. Steve Hughes	Water institutions, army corps budgets
Nic Lane	Power marketing, dams, and hydropower
Pervaze Sheikh	Ecosystem restoration
Stephen Viña	Legal issues

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